CLAIMS

1. Method of removing contaminants from a surface of a substrate by subjecting said substrate surface to an atmospheric pressure glow plasma generated in a discharge space comprising one or more electrodes, wherein said plasma is generated by applying an alternating plasma energizing voltage to said electrodes causing a plasma current and a displacement current, and wherein said plasma is stabilised by controlling said displacement current during plasma generation such that modification of properties of said substrate surface is prevented.

2. Method according to claim 1, wherein said step of controlling said displacement current comprises providing a relative decrease of said displacement current during plasma generation.

3. Method according to claim 2, wherein said relative decrease of said displacement current is provided in fractions of a microsecond, and wherein said relative decrease of said displacement current is at least 100% in a fraction of a microsecond.

4. Method according to any of the previous claims, wherein removing of said contaminants is performed in the presence of a gaseous substance or mixture of gasseous substances in said discharge space.

5. Method according to claim 4, wherein said gaseous substance or mixture of gaseous substances comprises at least one of a group comprising helium, argon, oxygen, nitrogen, carbon dioxide, ammonia, hydrogen, mixtures of oxygen with argon, mixtures of oxygen with helium, or mixtures of oxygen with argon and helium.

6. Method according to any of the previous claims, wherein said surface of said substrate comprises at least one transparent conductive oxide.

7. Method according to claim 8, wherein said transparent conductive oxide comprises at least one of a group comprising indium tin oxide, tin oxide, indium oxide, zinc oxide, indium cadmium oxide, cadmium

tin oxide, cadmium oxide, gallium oxide, and combinations thereof.

8. Method according to any of the claims 6 or 7, wherein said at least one transparent conductive oxide is coated on a dielectric or metal surface.

9. Method according to any of the previous claims, wherein said displacement current is controlled using controlling means, and wherein said controlling means comprises at least one inductor.

10. Method according to claim 9, wherein said at least one inductor comprises at least one of a group comprising a matching coil operated substantially in an unsaturated mode, and a choke coil operated in a saturated mode.

11. Method according to any of the previous claims, wherein said displacement current is controlled using controlling means, wherein said controlling means comprises pulse generator means providing voltage pulses superimposed on said energising voltage.

12. Method according to any of the previous claims, in dependence of claim 2, wherein said plasma comprises plasma pulse having an absolute pulse maximum, and wherein said displacement current is controlled by controlling said energizing voltage such that said relative decrease of said displacement current is provided before said pulse maximum.

13. Method according to claim 12, further comprising a step of synchronizing said relative decrease of said displacement current with the onset of said plasma pulse.

14. Method according to claim 12, wherein said energizing voltage is controlled such that said relative decrease of said displacement current is provided before the onset of said plasma pulse.

15. Method according to any of the previous claims, in dependence of claim 2, wherein said plasma comprises plasma pulse having an absolute pulse maximum, and wherein said displacement current is controlled by controlling said energizing voltage such that said relative

decrease of said displacement current is provided after said pulse maximum.

16. Method according to claim 15, further comprising a step of synchronizing said relative decrease of said displacement current with plasma instabilities after said pulse maximum.

17. Method according to claim 15 or 16, in dependence of claim 10, wherein said at least one inductor comprises a choke coil operated in a saturated mode during said plasma pulse after said pulse maximum.

18. Method according to any of the previous claims, in dependence of claim 2, wherein said energizing voltage is shaped such that said displacement current substantially comprises a triangular waveform.

19. Method according to any of the previous claims, wherein said substrate surface is moved through said discharge space.

20. Method according to claim 19, wherein said energizing voltage is an alternating voltage operated at a frequency in a range of 1 kHz and 1 MHz.

21. Method according to any of the previous claims, wherein at least one of said electrodes is covered by a dielectric material.

22. Apparatus for removing contaminants from a surface of a substrate by subjecting said substrate surface to an atmospheric pressure glow plasma, comprising a discharge space, wherein said discharge space comprises one or more electrodes, means for generating said atmospheric pressure glow plasma in said discharge space using said electrodes, wherein means for generating said plasma comprise means for applying an AC plasma energizing voltage to said electrodes for causing a plasma current and a displacement current, wherein said apparatus further comprises means for controlling said displacement current during plasma generation for stabilising said plasma such that modification of properties of said substrate surface is prevented.

23. Apparatus according to claim 22, wherein said means for

controlling said displacement current are arranged for providing a relative decrease of said displacement current during plasma generation.

24. Apparatus according to claim 22 or 23, wherein said means for controlling said displacement current comprises at least one of a group comprising an inductor, a matching coil arranged for being operated substantially in an unsaturated mode during plasma generation, a choke coil arranged for being operated in a saturated mode during plasma generation, and pulse generator means providing voltage pulses superimposed on said energising voltage.

25. Apparatus according to any of the claims 22-24, wherein at least one of said electrodes is covered by a dielectric material.

26. Apparatus according to any of the claims 22-25, wherein said means for generating said plasma are arranged for generating at least one plasma pulse having a pulse maximum, and wherein said means for controlling said displacement current are arranged for controlling said displacement current after said pulse maximum.

27. Apparatus according to claim 26, wherein said controlling means comprises a choke coil arranged for being operated in a saturated mode during plasma generation, and wherein said choke coil is arranged for being in a saturated state during said plasma pulse after said pulse maximum.

28. Apparatus according to any of the claims 22-27, wherein said means for generating said plasma are arranged for generating at least one plasma pulse having a pulse maximum, and wherein said means for controlling said displacement current are arranged for controlling said displacement current before said pulse maximum.

29. Apparatus according to any of the previous claims, further comprising means for moving said substrate surface through said discharge space.